

# EXHIBIT

## B – Part II

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- be adjusted such that this location is within 3/16 inch of its location shown on the contract drawings.
- b. Tolerances for masonry walls provided by another contractor shall be within 1/4 inch in 10 feet horizontally and within 1/8 inch in 10 feet vertically.
  2. Fasteners shall be 400 Series stainless steel, hex head screws with dished stainless steel and bonded EPDM washer. Heads shall be painted to match color of the panel.
- D. Trim Elements
1. All trim, copings, corners, terminations at sides, tops, bottoms, shingled transitions, etc., shall be fabricated from 6063-T5 extruded aluminum .125 inch thick conforming to profiles, sizes and arrangements noted, with interconnecting bosses and provisions for expansion and contraction. Bent metal will not be permitted unless accepted by the Architect.
  2. Finish shall be the same as panels specified herein.
- E. Galvanizing: Provide a zinc coating for those items shown on the Drawings or specified to be galvanized, using the hot-dip process after fabrication. Metal exposed to the exterior shall be galvanized. Zinc for galvanizing: slab zinc (Spelter) conforming to ASTM B-6 grade "Prime Western".
1. ASTM A-153 for galvanizing of iron and steel hardware, Class B2 (1.5 oz./sq. ft.).
  2. ASTM A-123 for galvanizing of rolled, pressed and forged steel shapes, plates, bars and strips 1/8 inch thick and heavier.
  3. ASTM A-386 for galvanizing of assembled steel products.
- F. Galvanizing repair paint: High zinc-dust content paint for regalvanizing welds in galvanized steel, complying with Federal Specifications DOD-P-21035 or MIL-P-26915.
- G. Air barrier shall be 24 gauge galvanized sheet steel as per ASTM A-446 Grade A with galvanizing as per ASTM A-525 G-90.
- H. Insulation
1. Semi-rigid mineral fiber curtain wall insulation with reinforced foil face vapor retarder, having a density of 3.0 pcf, a thickness of 2-1/2 inches unless otherwise shown on drawings, and conforming to ASTM C-665.
    - a. Wall insulation to be mechanically fastened to framing members, 12" on center. Adhesive attachment of insulation or retaining clips shall not be acceptable.
    - b. Acceptable Manufacturer
      - (1) USG Interiors, Inc. - Thermafiber CW-90

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2. Mechanical Clips

- a. Clips for securing insulation in place shall be spindle anchor and washer type consisting of perforated metal plates with spindle welded to center and snap-on washers. Spindle and washers shall receive a corrosion resistant electro-zinc plating. Adhesives for securing clips in place: as recommended by the clip manufacturer.

- b. Acceptable Manufacturers

- (1) Miracle Adhesives Corp.
- (2) Stic-Klip Mfg. Co.
- (3) or an equal acceptable to the Architect.

I. Profiled Closure Gaskets

1. As recommended by the panel manufacturer in the exact profile of the accepted panel and made of elastomeric preformed, non-combustible, non-staining material.

J. Safing Insulation (Perimeter of Slabs)

1. Spun mineral wool, semi-rigid, non-combustible, conforming to ASTM C-665, Type 1, 4 lb. pcf density. Fire hazard classification (ASTM E-84) flame spread 25, fuel contributed 0, smoke developed 0. Thickness shall be 4" minimum.
2. Manufacturer: U.S. Gypsum Thermafiber or an acceptable equal.
3. Provide 26 gauge electro-galvanized metal impaling clips made especially for supporting insulation from floor slab.
4. Caulking compound shall be manufacturer approved for sealing joints between insulation and edge of concrete against penetration of smoke.

K. Intermittent stabilization anchors for exterior building maintenance shall consist of a stainless steel bolt especially in place on the building facades. Hexhead.

1. Standard fastener configuration 1/2 inch x 7/8 inch.
2. Acceptable Manufacturer
  - a. Dodge Machine Co., Inc., Hoosick Falls, NY (518) 686-7371 "DCM".
  - b. or an equal acceptable to the Architect.

L. Stainless flashing shall be dead soft, Type 304, fully annealed, 24 gauge and conforming to ASTM A-167 complete with butyl sealants for loose locked joints.

2.03 FABRICATION

- A. Execute work using skilled workers, especially trained and experienced in the applicable trades employed and in full conformity with applicable provisions of the listed References and Standards and as otherwise noted on the drawings or as specified herein.

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- B. Metals shall be free from defects impairing strength, durability, or appearance, and the best commercial quality for purposes specified. Metals shall be new materials and made with structural properties to safely sustain or withstand stresses and strains to which normally subjected. Members, true to details, clean and straight with curved work true to radii with smooth finished surfaces.
- C. Include supplementary parts necessary to complete each item as required and necessary to function for use intended. Anchors, brackets, plates, etc. for securing work to the adjacent construction shall be provided to suit encountered conditions.
- D. For the fabrication of metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes and including zinc coatings.
- E. Comply with the dimensions, profile limitations, gauges and fabrication details shown and, to the extent not shown, provide manufacturer's standard product fabrication.
- F. Prefabricate the components, trim and accessories to the greatest extent possible at the factory, so that field erection and assembly work will be minimized.
- G. Fabricate components to comply with the performance testing requirements specified hereinbefore.
- H. Execute forming and welding operations prior to finishing operations.
- I. Carefully fabricate and assemble work with proper and necessary provisions for noiseless thermal expansion, contraction, and seismic movement and fabrication and erection tolerances, adjoining building component tolerances and dynamic movements. Expansion joints shall be so designed and constructed that they will be and remain permanently watertight.
- J. Joints in Metal Work
  - 1. Exposed work shall be carefully matched to produce continuity of line, design and finish. Joints unless otherwise shown or required for thermal movement, shall be accurately fitted and rigidly secured with hairline contacts and sealed in watertight manner.
  - 2. Where two or more sections of metal are used in building up members, the surface in contact shall be brought to a smooth, true and even surface and secured together so that the joints shall be absolutely tight without the use of any pointing material. Exposed sealants except where shown will not be permitted. Extrusions shall be tolerated to eliminate any edge projection or misalignment at joints.
- K. Forming: Use continuous end rolling method in the factory. Field rolled or press broken profiles are not acceptable.
- L. Trim
  - 1. The extruded aluminum trim shall be fabricated in as long lengths as practical, with interconnecting bosses and provisions for expansion and contraction.

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M. Connecting and Fastening Devices

1. Fastenings: Of a strength sufficient to support both horizontal wind load and vertical dead load, with a minimum 4 to 1 safety allowance and spaced and of such sizes as will develop the maximum strength of members they secure or support, in terms of adequate unit stresses, in accordance with submitted shop drawings.
2. Seal and tool fasteners penetrating watertight or airtight assemblies. Air barrier shall be secured to the encountered structure using a combination of metal screws and neoprene washers and self-adhesive reinforced tape products having 6" minimum width and double seal per the details.
3. Furnish to other trades, proper anchoring inserts and other supporting devices which will be required to set into the concrete, attached to structural steel or otherwise attached to masonry or metal. Furnish location drawings along with the devices to be embedded well in advance of this work to assure job progress. Supporting devices shall be steel; aluminum devices will not be permitted for structural connections.
4. Fasteners shall be stainless steel with locking devices, plastic/nylon locking device shall not be acceptable, and of sufficient size and strength to withstand the applicable design wind load and dead load forces with safety allowance factors as required for the specific materials. The spacing and quantity of fasteners shall be determined by the Contractor and as required to achieve the maximum strength of the members they secure and support. Washers and/or other accessory items shall be of the same materials as the fasteners. Torque tighten all assembly fasteners to achieve the maximum torque-tension relationship in the fastener.
5. Fasteners shall be concealed unless otherwise shown. The head style for all exposed fasteners shall be countersunk oval head with a Phillip driving recess unless otherwise noted. Exposed fasteners to be finished to match surrounding metal finish.

N. Protection of Metals

1. Provide protection against galvanic action wherever dissimilar metals are in contact. Call out on shop drawings and submittals all materials proposed to separate dissimilar metals.
2. Aluminum which is to be in contact with dissimilar materials shall have its contact surfaces protected wherever the contact surfaces may entrap moisture and corrosive elements. Metals which are to be in contact with concrete, masonry or mortar shall have their contact surfaces protected with an acceptable coating or separator.
3. Separate metal surfaces in such a manner that metal does not move on metal. Materials used for this purpose shall be lubricating devices, sealants or gaskets.

O. Welding

1. All welding in aluminum work shall be done by the inert gas shielded arc or fluxless resistant techniques, be in accord with pertinent recommendations of the American Welding Society, and shall be done with electrodes and/or by methods recommended by the

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suppliers of the metals being welded. Type, size and spacing of welds shall be as shown on the reviewed submittals.

2. Welds in ferrous material shall comply with "Code for Arc and Gas Welding in Building Construction" of American Welding Society, AWS D1.0, latest edition. Welds in galvanized metal shall be touched-up with zinc rich paint.
3. Welds behind finished aluminum surfaces shall be done in an acceptable manner to eliminate distortion and discoloration on the finished side. Remove weld spatter and welding oxides on finished surfaces by de-scaling and grinding. Provide low heat filled welds using chill bar on finished side to eliminate dimpling, distorting and discoloration on the finished or exposed surface. Plug, puddle or spot welding will not be permitted.
4. Where weldments are to be made on material that have been previously fluoropon-coated, the area of fusion shall be free of the anodic/fluoropon coated film prior to welding. Parts to be so welded shall be masked during fluoropon-coating or sanded clean in the weld areas. Only weldments that will be concealed may be so made. Cracking or discoloring of the fluoropon-coating in the weld area will not be acceptable in exposed areas.

## P. Reinforcing

1. Provide internal galvanized steel reinforcing components as required to conform to performance criteria and as necessary and required to accommodate adjacent work relying on this work for support.

- Q. Fabricate the internal stainless flashing, weeps and guttering system to be watertight and readily eject to exterior all penetrating water or condensate.

## 2.04 SHOP APPLIED FINISHES

## A. General

1. Complete cutting, fitting, forming, drilling and grinding of metal work prior to cleaning, finishing, surface treatment and application of finishes.
2. Provide factory applied strippable protective covering as required to protect assemblies from damage during shipping and installation.
3. Comply with NAAMM "Metal Finishes Manual" for recommendations and designations of finishes, except as otherwise shown or specified.

## B. Baked-on Fluoropolymer (Exposed to Exterior)

1. It is the intention of the specification that the color variation between adjacent parts of the same finish be imperceptible to the naked eye under normal daylight conditions. To this end, the Contractor shall submit range samples defining the maximum variation of color that can be anticipated in the work. Pieces abutting or within 6' of each other in the construction shall not vary in color by more than 1/2 the range so as the variation to be imperceptible to the naked eye under normal daylight conditions. Parts shall be carefully inspected in the shop and graded for assembly compatibility and marked for installation location.

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2. Contractor shall, in the construction of testing mock-ups, finish the various components to show the maximum variation that will exist in the actual building construction between adjacent and non-adjacent components.
3. The Contractor shall establish and submit for review a quality control program to assure compliance with the specified requirements. The program shall include documented procedures, processes, etc. Contractor shall maintain complete certified inspection, testing and process records of finishing procedures. Copies of said records shall be provided to the Architect and Owner upon request. No finishing shall be performed prior to approval of this quality control program.
4. Contractor shall not ship any material that has not been inspected, tested and marked in the prescribed manner, does not fall within the prescribed color range, or has been rejected by the Architect.
5. All aluminum exposed to view shall receive a factory-applied baked-on three-coating system based on a fluorocarbon resin (polyvinylidene fluoride), 70% "Kynar 500" by Autochem or "Hylar 5000" by Ausimont USA, finish and epoxy primer base, manufactured by Pennwalt Corporation and conforming to AAMA 605.2 and as follows:

PPG Duranar XLE (coil coating) 52M92767 Bright Silver with SMC95417 clear (four coat, 20 yr. warranty)

M1            Profiled metal panel IW60. Exterior wall cladding at faceted wall, shinglewall, east wall

Medium Gray from manufacturer's standard finish (Three (3) coat [20 year warranty])

M-3            Profiled metal panel C-14-40. Mechanical wells at cooling tower, inside face of high parapets

- a. or an equal acceptable to the Architect.
6. Criteria for Metallic Coated Finishes
  - a. When using metallic coatings, separate and schedule the production of one batch of paint for each specified color. To coordinate this batch, all applicators involved in the project should inform the lead applicator of their gallon requirements.
  - b. Submit "range samples" sprayed from actual production equipment. These range samples should be reviewed by the Architect. One set of range samples shall be returned to the applicator and one set shall remain with the Architect.
  - c. Panels shall be painted using directional arrows as a guide for panel placement on the building when a metallic coating is specified. The panel supplier shall be responsible for marking the arrows on the back side of the panels. Uniform orientation of metallic flake is critical for color consistency. (This marking is most important in areas where panels are placed adjacent to each other.)



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- d. Finish shall be applied by an applicator licensed by PPG Industries in strict conformance with their specifications for cleaning, priming, finish coat applications and quality control.
- e. The Duranar XL (XL refers to XL and XLE coatings typically) finish coating shall be factory applied, oven baked finish based on Kynar 500 (Polyvinylidene Fluoride - PVF<sub>2</sub> as supplied by PPG Industries. Application of the Duranar XL finish based on Kynar 500 shall be performed under Specifications issued by PPG and by an applicator specifically approved by PPG. Said applicator shall provide written notification to Architect of approval by PPG prior to application of the Duranar XL finish. The Duranar XL coating system shall be applied to properly cleaned and pretreated aluminum. The pretreatment shall meet ASTM D-1730, Type B, Method 5 or Method 7. Processing shall conform with ASTM B-449 Section 5. Conversion coating weight shall be between 30-100 mgms per square foot.
- f. The Duranar XL finish shall meet or exceed the requirements of AAMA 605.2, "Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels", and the following minimum properties:
  - (1) Color change and fade resistance - ASTM E-838: A sample in accordance with ASTM E-838 shall withstand an EMMAQUA weathering test exposure (Exterior Equatorial mount with mirrors and water spray) for 800,000 Langley's or ultra-violet radiation without cracking, peeling, blistering or loss of adhesion. Maximum color change, after removal of all exterior or surface deposits such as dirt or chalk, shall not exceed 5 NBS units.
  - (2) Abrasion-resistance test for coating system - ASTM D-968: A flat specimen shall be subject to abrasion-resistance test. Test shall be conducted in accordance with ASTM D-968 (Falling Sand). Coating system shall resist abrasion to extent indicated by use of ASTM approved sand measured in liters necessary to produce the exposure of 3.9 mm diameter area of base metal. Minimum 300 liters.
  - (3) Coating systems integrity test - ASTM B-117: A flat sample with protected edges shall withstand a salt-fog test per ASTM B-117, including a scribe made prior to beginning the procedure. Immediately upon removal of specimen from test, after a number of hours, the panels are evaluated in accordance with ASTM D-714 for minimum 1000 hours; no blistering; max. 1 mm creepage at scribe.
  - (4) Pollution-resistance test - ASTM G-87: A flat specimen, with no protected edges, shall be subjected to 300 cycles of Kesternich testing in accordance with ASTM G-87. Test consists of eight hours of exposure at 104 degrees Fahrenheit (40 degrees Centigrade) with 100% relative humidity (condensing) in a controlled sulfur dioxide (SO<sub>2</sub>) atmosphere. Atmospheric concentration of pollutant gases shall be in accordance with Kesternich test standards (2.0 liters of SO<sub>2</sub>). This shall be followed by 16 hours of dry time, which concludes one cycle of testing. After 30 cycles, review specimen per



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ASTM D-714, there shall be no blistering with max. 1 mm edge creepage.

- (5) Humidity-resistance test - ASTM D-2247: A sample shall be tested for 1,000 hours at 100 degrees Fahrenheit (38 degrees Centigrade) at 100% relative humidity, in accordance with ASTM D-2247 with no blistering, peeling or loss of adhesion.

- (6) Pencil Hardness: F minimum with Eagle Turquoise Pencil.

- (7) Dry Film Thickness:

Primer:	0.3 + 0.1 mils
Barrier Coat for XLE:	Per PPG requirements.
Top Coat:	Minimum 1.0 mils (pigmented metallic)
Clear Top Coat:	0.4 to 0.8 mils

- (8) Adhesion: No pick off when tape tested over 1/16" crosshatch wet and dry.

- g. Contractor shall submit test reports on tests performed on samples randomly selected from production indicating compliance of finish with all the above enumerated requirements as well as those enumerated in paint manufacturer's published literature on samples selected at random from production runs. In addition and during production, Contractor shall test on a daily basis on each shift for compliance with items, (1), (2), (5), (6) and (7) above and standards for pretreatment and coating thickness, as verified by testing in accordance with applicable standards, etc.

7. All unexposed surfaces shall have as a minimum the Duranar XL system prime coat, of the hereinabove specified finish.

C. Liner Finish

1. Coating system of the interior facing surface of liners shall be nominal 0.3 mil epoxy primer and nominal 0.8 mil color acrylic polyester paint.
2. Color of interior to be manufacturer's standard white or off-white.
3. Interior of liner (outward facing) surface shall be finished the same as the interior facing side.

- D. Shop painting of carbon steel: Items of carbon steel, unless galvanized or scheduled for other finish, shall be thoroughly cleaned of loose scale, filings, dirt and other foreign matter, and painted with zinc chromate primer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Study the Contract drawings and specifications with regard to the work as shown and required under this Section so as to insure its completeness.

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- B. Examine surfaces and conditions to which this work is to be attached and notify the Architect and the Construction Manager if conditions or surfaces exist which are detrimental to the proper and expeditious installation of the work. Starting on the work shall imply acceptance of the surfaces and conditions to perform the work as specified.
  - C. Verify dimensions taken at the job site affecting the work. Bring field dimensions which are at variance, to the attention of the Architect and the Construction Manager. Obtain decision regarding corrective measures before the start of installation.
  - D. Cooperate in the coordination and scheduling of the work of this Section with the work of other Sections so as not to delay job progress.
  - E. A licensed surveyor retained by the Contractor shall make an accurate survey of structural steel tube girts and concrete masonry walls supporting metal panels prior to installation. Notify the Architect and the Construction Manager in writing of field dimensions which are at variance. The construction manager will determine whether to bring existing work into tolerance or direct Contractor to modify panel connection design. Building tolerances shall not exceed maximums as defined in AISC or ACI specifications.
- 3.02 INSTALLATION - GENERAL
- A. Erection shall be carried out in a first class workmanlike manner by mechanics experienced in the application of this material. Installation of material shall be performed under experienced supervision and in strict accordance with the reviewed submittals and encountered field conditions.
  - B. Bench marks for elevations and building line offset marks for alignment shall be established on each floor level.
  - C. Install materials specified herein within the temperature and humidity criteria recommended by the manufacturer of each material. Under no circumstances shall materials be installed on surfaces which contact frost, condensation, dirt, grime or other foreign encountered materials which will hinder or create a set of circumstances which will prevent the materials from properly being installed, and once installed from functioning for use intended.
  - D. Carefully and accurately assemble with proper provision for contraction, expansion and seismic movement, and install plumb and level at the required lines and elevations, within normal construction tolerances and finish straight, smooth and even, free from defects, and to profiles and sections shown on the drawings. Assemble work so that joints are watertight, neat and finished smooth.
  - E. Erection tolerances: Components shall be erected as shown on the drawings and in proper alignment and relation to established lines and grades. The installed components shall conform to the following erection tolerances:
    - 1. Amount of total deviation of misalignment in any direction for vertical members: 1/8 inch maximum in 24'-0" or a maximum of 1/4 inch in a 48'-0" run.
    - 2. Amount of total deviation or misalignment in any direction for horizontal members: 1/8 inch maximum in a 25-foot run.

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3. Maximum offset from true alignment between two abutting members will be 1/32 inch. No edge projection will be permitted.
  4. Maximum joint gap or opening between filler or closure and its adjacent member will be 1/32 inch.
  5. Variations from theoretical calculated position as located in plan or elevation in relation to established floor lines, column lines and other fixed elements of the structure:
    - a. 1/4 inch maximum variation in any column-to-column space or floor-to-floor height, or 45 feet run.
    - b. 1/4 inch maximum total variation at any location.
  6. Offsets in end-to-end or edge-to-edge alignment of consecutive members: 1/32 inch maximum offset in any alignment.
  7. Allowances for the cumulative effect of all tolerances (fabrication, assembly, thermal, building, and erection) shall be made to ensure a workmanlike and weatherproof installation. The documentation and distribution of this information to the applicable installation and inspection personnel are essential in order to ensure the standards of quality and workmanship required.
- F. Wherever aluminum comes in contact with the steel surfaces, the contact surfaces shall be provided with proper type separators and other devices which shall prevent galvanic action from taking place.
- G. Anchorage of the work to the structure shall be by proper methods and in strict accord with the reviewed shop drawings. After the components are properly positioned rigidly fix the connections by welding or other positive means. Install clip angles to the structure for the support of the metal wall panels. Provide additional clip angles, shims, washers, bolts, separators, locknuts and other support anchoring devices. Provide steel clip angles, outriggers and other miscellaneous supporting members which shall be properly secured to the structure.
- H. Welding
1. Perform welding using skilled mechanics qualified or licensed in accord with local building regulations, and shall conform to the recommended practices of the American Welding Society. Clean welds and adjoining burned areas in prime coated surfaces thoroughly and repaint with one coat of primer and coat welds in galvanized steel with one coat of zinc-rich paint. Take special care to protect glass and other finished surfaces from damage and to prevent fires. Preheat structural steel building components as required for the full penetration and distribution of structural welds.
- I. Sealing
1. Uses of sealing materials shall be in strict accordance with the recommendations of the manufacturer of the material. Sealants, tapes, gaskets, separators, joint filler and back-up materials shall be physically and chemically compatible with each other and with adjacent materials. Items shall be installed so that they will not become dislodged during or after assembly of units.

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- J. Perimeter Slab Safing Insulation
1. Install the safing insulation between the metal wall panels and the floor slab on safing clips spaced a maximum of 24 inches o.c. leaving no voids. Cut wider than opening to insure a compression fit of the safing insulation.
- K. Do not erect members which are observed to be warped, bowed, deformed or otherwise damaged or defaced to such extent as to impair strength or appearance. Remove and replace members damaged in the process of erection, as directed.
- L. Set units level, plumb (or as shown on drawings) and true to line, with uniform joints. Support on metal shims and secure in place by bolting and similar supports anchored to supporting structure. Use only the types of equipment, spacers, shims and other items during erection which will not stain or mark the finish of units. Align and shim as required to result in a smooth regular alignment of panels with plumb and horizontal, evenly spaced joints and with panels all in continuous planes. Continually check the alignment of panels during erection.
- M. Where attachment from the back of the support member is necessary and/or required, use appropriate fasteners in strict conformance with reviewed submittals. Coordinate with other Contractors to maintain access to all points of attachment.
- N. It shall be this Contractor's responsibility to erect a watertight system. This Contractor shall see to it that all joints, gaps, penetrations, buttered surfaces and all other surfaces to be made watertight have been sealed whether or not mentioned above or indicated on the drawings.
1. Provide an internal flashing weep system to readily eject to exterior all water and/or condensate.
  2. All flashing shall be clearly shown on shop drawings and coordinated with other adjacent work.
- 3.03 INSTALLATION - SPECIFIC
- A. Air Infiltration Barrier
1. Prior to the installation of the metal wall panels an air infiltration barrier shall be installed creating a monolithic, no-gaps air barrier, which shall be secured in place to the encountered structure using a combination of metal screws and neoprene washers and self-adhesive reinforced tape products having 3 inch minimum width and double seal per the details.
  2. Install with as few joints as practical and secure and tape in place to create a no-leak monolithic air barrier.
- B. Exposed Profiled Panels (Without Liner Panels)
1. To the encountered steel framing members install continuous steel subgirts and secure in parallel rows in a level, rigid and secure manner.
  2. Install the insulation to the face of the galvanized sheet air barrier. Hold the insulation in place by being impaled on spindle anchors and washers or neatly cut and install on the subgirts or a combination of the two to prevent insulation dislodgment. Install insulation in as large sections as practical, to avoid as many

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field joints as possible. Secure anchor clips to surface using recommended adhesive. Provide a minimum of one (1) spindle anchor for each three (3) square feet of insulation. Impale insulation onto the anchors and hold in place by washers and prongs.

- C. Install the profiled steel wall panels vertically and secure to the sub-girts at the lap over joints using self-tapping fasteners as per the reviewed submittals.
1. Provide faceted and shingle arrangements as noted. For the shingle profiles provide custom aluminum articulated members as noted, which shall incorporate weep holes. Angles and slopes shall be uniform.
- D. Profiled Panels (With Inside Liners) (Penthouses)
1. To the encountered steel framing and supporting members secure the liner panels in a secure manner with side and end laps sealed to provide a vapor barrier.
  2. Into the liners install the acceptable insulation with the vapor barrier toward the inside surfaces. Neatly cut to suit encountered conditions and filling all voids.
  3. Liners to be factory butyl caulked to provide vapor barrier. All end laps to be butt joined and field caulked with butyl caulking.
  4. Install continuous horizontal subgirts to the liner panels in parallel rows using laps and screw spacing as per the reviewed shop drawings.
  5. Install the profiled steel wall panels vertically and secure to the subgirts at the lap over joints using self-tapping fasteners as per the reviewed submittals.
- E. Non-Insulated, Non-Liner Corrugated Panels (Mechanical Walls - Cooling Tower & High Parapets)
1. Install horizontal subgirts to the encountered structure, as per the reviewed submittals and install the vertical panels in sequence fashion and parallel to each other in a secure and rigid manner.
- F. Closures, Trim, Etc.
1. Prior to installing the closures (tops, bottoms, sides, corners) install the preformed profiled closure gaskets to seal the ends of the panels. Install in as long lengths as practical and with neatly butted ends.
  2. Install the closures, trim, corners and termination members, before and after panel installation to conform to intent noted. Install in as long lengths as practical. Execute horizontal or vertical changes of plane without the use of superimposed trim. Secure to encountered construction using appropriate type fasteners with acceptable spacing; and when permitted to be exposed, to match exterior panel color. Neatly miter inside and outside corners.
  3. Interior trim shall be of the same material, gauge and finish as the liner and used as indicated on drawings. Use sufficient interior trim to assure liner is maintained as the vapor barrier for the metal wall.

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- G. Install the intermittent stabilizer bolt assemblies vertically and regularly spaced as noted and secured to the horizontal girts in a rigid and secure manner so as to achieve the desired pull-out test.
  - H. It is the Contractor's responsibility to erect a watertight system. The Contractor shall see to it that all joints, gaps, penetrations, buttered surfaces and all other surfaces to be made watertight have been sealed whether or not mentioned above or indicated on the drawings.
  - I. Postponement of Complete Enclosures
    - 1. If so required, installation of the metal wall panels shall be postponed in areas as designated by the Construction Manager for a specified period of time so as to facilitate moving material into and out of the building during construction.
- 3.04 JOB SITE QUALITY CONTROL
- A. Job site quality control procedures will include, but not necessarily be limited to, the following:
    - 1. Anchorage: Lines, grades and related building tolerances and correct layout and installation of anchors.
    - 2. Finish and match: Procedures required for the match of exposed surfaces.
    - 3. Installation: Tolerances, joinery, sleeves, flashings, welds, fasteners, sealants, etc.
    - 4. Sealing: As recommended by the sealant manufacturer(s). Include sealant documentation.
    - 5. Protection and cleaning: As recommended by the applicable manufacturer(s). Coordinate all procedures and requirements with the Contractor.
- 3.05 FIELD WATER TESTS

- A. Typical areas of each type of the work of this Section shall be checked for water penetration in accordance with AAMA Standards 501.2. Initial testing will be performed as early in the installation phase as possible. The Architect will designate the areas of the completed work not less than 2 column bays in width and to stories in height to be so checked and shall witness all tests. Contractor shall be required to perform three (3) "initially successful" water tests for each type of work.

Typical areas of each type of the metal wall panel work of this Section shall be checked for water penetration, employing a 24-hour "soaker rack" of same design and capacity as utilized for testing in accordance with ASTM E-331, except differential air pressure shall not be employed. The test area shall be a nominal 20 feet wide and be a minimum of 25 feet in length. Provide all interior scaffolding required to permit monitoring of the test. Initial testing will be performed as early in the installation phase as possible. The



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Architect will designate the areas of the completed work to be so checked and shall witness all tests.

- B. Depending upon the prevalence or absence of leakage in the initial water penetration tests, and upon the measures adopted by the Contractor to eliminate the source of leakage (if any) from subsequently erected work, the Architect will determine the necessity of (and scope of) additional tests. All retests required by the Architect due to repeated failures in "initial water tests" shall be performed by the Contractor at no additional cost to the Owner. Any corrective work required shall be the responsibility of the Contractor, along with the cost of retesting, the costs incurred by the Architect and the Owner. All remedial measures must maintain standards of quality and are subject to Architect's acceptance.

3.06 ADJUSTMENTS, CLEANING AND PROTECTION

A. Damage to Factory-Applied Finish

1. Should the factory-applied coatings become scratched, abraded, or damaged during transport, delivery, storage or erection, it shall be the Contractor's responsibility to remove and/or repair those defective areas or components, as directed by the Architect and to the satisfaction of the Architect.
2. It is the essence of this repair work that it shall be identical to the factory-applied finish with regards to texture gloss finish, appearance and performance.

B. Protection and Cleaning

1. Upon completion of work, remove protective coverings from exposed surfaces, and clean surfaces of dirt, grime and discoloration. Cleaning shall be in accord with the provisions of the requirements of the applicable manufacturers of the installed products.
2. Clean all exposed work erected by this Section. Remove all foreign matter and thoroughly clean metal using cleaning preparations which will in no way harm the surfaces. During this cleaning, repair damaged surfaces, scratches, marks, etc. found, to the satisfaction of the Architect and Owner.
4. Exercise care when cleaning the exterior portions of the building to protect other work and sealant to metal joint work.

- C. The finished installation of the work shall be free of defects. Before final completion and acceptance of the building, the Contractor shall repair and/or replace at his own expense defective work, to the satisfaction of the Owner and the Architect and as directed by the Architect. At the time of Substantial Completion, the Contractor shall demonstrate proper cleaning methods and materials to the Owner's maintenance personnel.

END OF SECTION



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SECTION 07627

EXTERIOR THRU-WALL STAINLESS FLASHING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Work of this Section shall be governed by the Contract Documents. Provide material, labor, equipment and services necessary to furnish and deliver all Work of this Section as shown on the Drawings, as specified herein, and/or as required by job conditions.
- B. The Work shall include, but is not limited to the following:
  - 1. Unit masonry Contractor to provide stainless flashing at:
    - a. Spandrel flashing in conjunction with lintels with end dams.
    - b. Base of walls.
  - 2. General Contruction #1 Contractor to provide:
    - a. Window sill flashing panels.
    - b. Jamb flashing at windows and curtainwall.
    - c. Head flashing at windows and curtainwall.
    - d. Metal parapet flashing.
    - e. Flashing at interfaces as shown on drawings.
  - 3. Soldered and loose locked joints.
  - 4. Anchoring means and methods.
  - 5. Sealant for all loose locked joints.
  - 6. Issuance of guarantee/warranty.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 04210: Brick masonry.
- B. Section 04222: Concrete masonry units.
- C. Section 04410: Cast stone work.
- D. Section 07192: Self-adhesive membrane - galvanized column enclosures.
- E. Section 07410: Field assembled wall panels.
- F. Section 08500: Aluminum windows.
- G. Section 08920: Glazed aluminum curtain walls.

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## 1.03 QUALITY ASSURANCES

## A. Qualifications

1. The firm executing the flashing work shall furnish certificates to verify that the firm has been continuously engaged in metal flashing work for not less than five (5) years.

## B. Reference Standards

## 1. American Society for Testing and Materials (ASTM)

ASTM A-167	Stainless Steel
ASTM A-666	Austenitic Stainless Steel
ASTM B-32	Solder Metal
ASTM C-920	Elastomeric Joint Sealants

## 2. Federal Specifications (FS)

FS O-F-56	Flux, Soldering Paste & Liquid
FS S-571	Solder, Tin Alloy
FS TT-S-00227C	Sealant
FS TT-S-00230 Type II	Sealant

## 3. American Institute of Steel Institute (AISI)

Alloy Type 302/304 (18-8)

## 4. Sheet Metal and Air Conditioning Contractors National Association Inc. (SMACNA)

## 5. Structural Steel Panting Council (SSPC)

SSPC No. 12 Bituminous Coating

## 6. American Welding Society (AWS)

## 1.04 SUBMITTALS

- A. The Samples and Certificates listed below are required to be submitted by the Contractor, through the Construction Manager, for review. An omission of an item or items does not relieve the Contractor from this responsibility, and for compliance with the Contract Documents, of which this is a part.

SAMPLES

Item No.	Quan.	Size	Description
S1	5	9" long	Flashing, loose and soldered joints and finish
S2	5	Actual	Anchoring devices, each type and kind

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NOTARIZED CERTIFICATES OF COMPLIANCE

Item No.	Description	Standard
C1	Stainless steel	Type 304, ASTM A-167
C2	Solder	ASTM B-32
C3	Acid flux	MIL-F-14256
C4	Bituminous coating	SSPC

B. Shop Drawings

1. The Contractor shall provide coordinated composite shop drawing submittals for the entire scope of work for this Contract including but not necessarily limited to Glazed Aluminum Curtain Walls, Aluminum Windows, Louvers, Stainless Steel Entrance Doors and Field Assembled Wall Panels, etc. Shop drawing submittals which do not show fully integrated details of the components shall be returned to the Contractor without review. Upon the return of such drawings, the Contractor shall be required to redraw and resubmit the required drawings at no additional cost to the Owner and with no impact whatsoever to the project schedule.
2. Submit for review in accordance with the requirements of the Contract Documents.
3. Shop drawings shall indicate sections and details noting jointing, profiles, arrangements, joint types, and anchoring means and methods.
  - a. Provide other details as required to clearly show the flashing work and its relationships to other building elements.
5. Clearly indicate the work to be provided by other trades and coordinate accordingly.

C. Submit manufacturers product data and catalog cuts.

- D. Submit qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architects and Owners, and other information specified.

E. Submit specimen of the warranty to be issued.

1.05 DELIVERY, STORAGE & HANDLING

- A. Delivered materials shall be identical to the reviewed submittals.
- B. Store materials under cover in a dry and clean location, off the ground, and remove materials which are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials. Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

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- C. Deliver in as long lengths as practical, which will result in as few joints as possible.
- 1.06 PROJECT CONDITIONS
  - A. Coordinate the work of this Section with interfacing and adjoining work for proper sequencing at each location and situation. Ensure the best possible weather resistance and durability of the work and protection of materials and finishes.
- 1.07 GUARANTEE
  - A. Guarantee flashing work for a minimum of ten (10) years from the date of final completion against poor workmanship, faulty materials and/or leakage of water into the interior of the building. Repairs shall be made promptly within the guarantee period and shall include labor and materials.
  - B. The guarantee shall be in a form acceptable to the Architect and the Owner, executed by a principal of the firm who has authorization to execute such a document, dated and notarized.

PART 2 - PRODUCTS

## 2.01 STAINLESS STEEL FLASHING

- A. Stainless steel shall conform to AISI Type 304 fully-annealed chrome nickel, dead soft conforming to ASTM A-167 and A-666.

## 1. Thicknesses

- a. Spandrel..... 0.010"
- b. Thru-wall..... 0.010"
- c. Lintel..... 0.018"
- d. Under sill..... 0.010"
- e. Base of wall..... 0.010"
- f. Jamb flashing..... 0.010"

- 2. Finish of exposed flashing, No. 2 for strip and No. 2B for sheet.

## 2.02 ACCESSORIES

- A. Solder shall be 60% tin, 40% lead conforming to ASTM B-32. Acid flux shall conform to FS O-F-506. Solder tinned surfaces with non-corrosive activated rosin flux of a minimum of 10 to 15 percent solids concentration.
- B. Fasteners
  - 1. Nails and other fastening devices: AISI 3030 Series stainless steel. 18 gauge diameter, annular-thread, diamond point large flat head lengths as required.
  - 2. Soft neoprene washers.
  - 3. Anchors

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- a. Hammer driven anchors, consisting of a stainless steel drive pin and a corrosion resistant metal expansion shield inserted thru a stainless steel disc with an EPDM sealing washer.
  - b. Self-tapping, corrosion resistant, concrete and masonry screw inserted thru a stainless steel disc with an EPDM sealing washer.
- C. Welding rods: Type recommended by stainless steel sheet manufacturer for type of metal sheets furnished.
- D. Sealants shall be high solids butyl conforming to Fed. Spec. TT-S-001657, Type 1, non-hardening, non-skinning, non-drying, and non-migrating.
- E. Cleats
- 1. Same metal and gauge as flashing/sheet metal being anchored.
  - 2. Size: 2 inches wide, punched for 2 anchors x 0.025".
- F. Bituminous coating shall conform to FS TT-C-494 or SSPC Paint 12, solvent type, bituminous mastic, nominally free of sulfur, compounded for 15 mil dry film thickness per coat.
- 2.03 FABRICATION
- A. Shop fabricate work to greatest extent possible. Comply with details shown and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance, with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.
  - B. Fabricate non-moving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.
  - C. Expansion provisions: Where lapped or bayonet-type expansion provisions in work cannot be used or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant (concealed within joints).
  - D. Sealant joints: Where movable, nonexpansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.

PART 3 - EXECUTION

## 3.01 EXAMINATION

- A. Study the Contract drawings and specifications with regard to the work as shown and required under this Section so as to insure its completeness.
- B. Examine surfaces and conditions to which this work is to be attached or applied, and notify the Architect if conditions exist which are detrimental to the proper and expeditious installation of the work.
- C. Verify dimensions taken at the job site, affecting the work. Bring field dimensions which are at variance to the attention of the Architect. Obtain decision regarding measures to be taken before the start of installation of items affected.
- D. Cooperate in the coordination and scheduling of the work of this section with the work of other sections so as not to delay job progress.
- E. Surfaces to receive sheet metal work shall be firm, smooth, fully cured, clean and dry.

## 3.02 GENERAL REQUIREMENTS

- A. Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations and with SMACNA "Architectural Sheet Metal Manual". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and waterproof.
- B. Do not perform work where the abutting or adjacent surfaces are wet and/or damp.
- C. Fabricate and install the work in accordance with details shown on drawings. Details shown on drawings shall be considered typical and shall apply for similar features where not particularly detailed. Contractor is responsible for providing control joints required for proper installation in the work to compensate for thermal expansion and contraction. Provide watertight expansion type seams every twenty-four feet (24') o.c. maximum. Provide seams at two feet (2') each side of corner intersections, and odd angles.
  - 1. Provide factory fabricated inside and outside flashing assemblies.
- D. Use large head nails electrolytically compatible with the material being nailed. Where sealant-filled expansion joints are used, embed the hooked flanges of the joint members not less than 1" into the sealant. Form joints to completely conceal the sealant.
- E. On vertical surfaces lap 2 piece flashings a minimum of 4". On sloping surfaces for slopes of not less than 6" in 12", lap unsealed flashing a minimum of 4".
- F. Install flashing so that it is watertight, free from visible waves, buckles, dents and other defects of material and workmanship which would affect its strength, durability or appearance.
- G. Cutting, patching, fitting, etc. of the work shall be neatly and carefully performed as required for the work of other trades, and so as

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to leave such work complete, watertight and in a condition satisfactory to the Architect.

- H. Sheet metal work shall be securely fastened in place and formed to resist loosening by thermal expansion.
- I. Build-in as the construction progresses, where required, and coordinate the requirements of the various sections so as to assure the proper fabrication and installation of all related work.
- J. Separate stainless steel from dissimilar metals, including regular steel and iron, and from cementitious materials by a 15 mil coat of bituminous cement. Comply with manufacturer's recommendations for other forms of protection of the stainless steel against corrosion.
- K. Pre-tin the edges to be soldered, for a width of 1-1/2", using solder and acid flux. Remove acid flux residue after tinning or soldering. Comply with the manufacturer's recommended methods for cleaning and neutralization.
- L. Clean exposed surfaces of substances which are visible or might cause corrosion of the metal surfaces. Exercise extreme care to remove fluxes and ferrous metal particles including welding splatter and grinding dust.
- M. For fixed joints and seams provide soldered flat locked seams with flux removed.
- N. Furnish flashing in 8' to 10' lengths and join with flat-locked soldered seams. Provide expansion joint at not over 24-foot intervals in any run with a loose lock with caulked seams.
- O. Lock seams shall finish 1/2" wide, overlap at least 4 inches, surfaces, corners prefabricated under shop conditions. Fill expansion lock joints with butyl sealant. Seams shall be made in the direction of the flow of water.
- P. Coordinate interfaces with roofing contractor so as not to adversely affect the performance and warranties required by the roofing systems provided by the roofing contractor.

## 3.03 INSTALLATION

## A. Spandrel Thru Wall Flashing (Masonry Walls)

- 1. This flashing shall be installed as an integral part of the masonry work although it is specified herein. Close and intimate coordination shall be exercised between the masonry and this sheet metal trade Contractor whenever and wherever metal flashing is indicated, required and specified herein.
- 2. Cavity walls: Flashing shall start 1/2" back from face of exposed masonry unit run over lintel, and turn vertically up the inside face, cross the cavity and run up the face of the backup and turn into a joint. Turn flashing under lintel face.
- 3. Regulate and schedule the work so that the installed flashing will not be exposed more than 24 hours before the masonry is built to conceal it.
- 4. Install continuous base of wall flashing.



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- B. Isolated Openings
    - 1. At lintel locations place flashing directly on the horizontal portion of the lintel and place compressible material over bolt heads to prevent puncturing and a bed of sealant or mastic between the flashing and the lintel and with end dams at each end.
    - 2. Install continuous flashing over window at heads and sills with turned up end dams at each end.
  - C. Install flashing so it is continuous without gaps and without discontinuities. Flashing shall be continuous around all corners and encountered offsets with sealed overlapped joints.
  - D. Use end dams where masonry meets another wall system (windows, framing, etc.) and seal the end dams and use mastic at upturned end against the other wall systems at least 4" high and as shown on the drawings.
- 3.04 CLEANING AND PROTECTION
- A. Clean exposed surfaces of flashing of foreign materials and other substances which might cause corrosion. Remove fluxes, metal particles, weld splatter and grinding dust.
  - B. Exercise care to protect installed work. Work which does become damaged in any way or is not watertight shall be repaired and/or replaced as directed to the satisfaction of Architect and/or Owner and at no additional cost or time.

END OF SECTION

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SECTION 14200

ELEVATORS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Work of this section shall be governed by the Contact Documents. Provide material, labor, equipment and services necessary to furnish and deliver all Work of this Section as shown on the Drawings, as specified herein, and/or as required by job conditions.
- B. The work shall include, but is not limited to the following:
  - 1. Nine (9) gearless traction passenger elevators
  - 2. Two (2) holeless hydraulic passenger elevators
  - 3. Two (2) geared traction service elevators
  - 4. Compliance with the general requirements.
  - 5. Structural steel components as designated on the structural drawings and as specified under Section 05115.
  - 6. Refer to the "Form of Bid" for alternates for extended maintenance services and Warranty Services Agreement.

1.02 RELATED WORK BY OTHERS UNLESS SPECIFIED OTHERWISE

- A. Section 04223: Interior concrete block and grouting
- B. Section 09250: Gypsum board for lobbies, shafts and machine room walls including cutting and patching.
- C. Section 07140: Pit waterproofing
- D. Division 15: Ventilation of hoistway and machine room
- E. Division 16: Power feeders to starter panels thru fused main line switches
- F. Division 16: Branch circuits thru fused disconnects for car lights
- G. Division 16: Lights and receptacles in machine room and pit

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- H. Division 16: Emergency power branch circuit to elevator controller to initiate automatic elevator lowering operation
- I. Division 16: Life safety system speakers and telephone communication wiring to a junction box in the machine room for each elevator.
- J. Division 16: Shunt trip devices to automatically disconnect the main power supply to the elevators prior to the activation of sprinkler system

#### 1.03 QUALITY ASSURANCE

##### A. Qualifications

- 1. The work of this Section shall be performed by one regularly engaged in the business of manufacturing, installing and servicing conveying systems of the type and character required by these specifications.
- 2. Contractor must have successfully performed at least two similar installations which included maintenance services. To be considered similar, prior installations shall have the equivalent size, groups, capacities, speeds and exact equipment being proposed for this contract.

#### 1.04 REGULATORY AGENCIES

##### A. Conform to

- 1. City of New York - RS 18 Standard and local laws
- 2. New York City Building Code
- 3. ASME A17.1 and latest amendments and supplements
- 4. NFPA Codes
- 5. ADAAG
- 6. ASME A17.5/CSA - B44.1 - Elevator and Escalator Electrical Equipment

#### 1.05 REFERENCE STANDARDS

- A. AISC - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

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- B. ANSI A117.1 - Buildings and Facilities - Providing Accessibility and Usability for Physically Handicapped People.
- C. ANSI/ASME A17.2 - Inspector's Manual for Elevators and Escalators.
- D. ASTM A36 - Structural Steel
- E. ASTM A366 - Steel, Sheet, Carbon, Col-Rolled, Commercial Quality
- F. ANSI/AWS D1.1 - Structural Welding Code, Steel
- G. ANSI/NFPA 70 - National Electrical Code
- H. ANSI/NFPA 80 - Fire Doors and Windows
- I. ANSI/UL 10B - Fire Tests of Door Assemblies
- J. APA - American Plywood Association
- K. ASTM A139 - Electric-Fusion (ARC) Welded Steel Pipe (NPS 4 Inch and Over)
- L. ASTM A167 - Stainless and Heat-Resisting Chromium Nickel Steel Plate, Sheet and Strip
- M. ASTM A446 - Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality
- N. ASTM B221 - Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes
- O. NEMA LD3 - High Pressure Decorative Laminates
- P. ANSI/IEEE - 519-1992
- Q. ANSI/IEEE - Guide for Surge Withstand Capability (SWC) Tests

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1.06 SUBMITTALS

A. Submit the following

1. Samples (five of each)

Item No.	Quantity	Size	Description
S1	3	12" x 12"	Exposed finishes as requested by Architect
S2	1	Actual	Each fixture as requested by the Architect
S3	1	Actual	Mitered, corner construction of stainless steel entrance frame

2. Shop Drawings

- a. Machine room plan indicating:
  - (1) Location of Equipment
  - (2) Service Connections
  - (3) Power unit weights
- b. Fully dimensioned hoistway/wellway plan and section of each unit indicating:
  - (1) Platform (with cab), hoistway and entrance dimensions
  - (2) All running clearances
  - (3) Location of fixtures
  - (4) Buffers, service ladders and pit reactions
  - (5) Location of inserts
- c. Entrance details
- d. Sill support angle details

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- e. Fixture details
- f. Wiring diagrams

3. Calculations

- a. Rail loads
- b. Pit reactions
- c. Heat emissions in machine room
- d. Electrical loads including starting, accelerating and running currents. Include all auxiliary loads.

1.07 PERMITS, TESTING AND INSPECTIONS

- A. File necessary drawings for approval of all authorities having jurisdiction, obtain and pay all required fees for permits and inspections, etc., which may be required for the execution of his work. Copies of all permits shall be forwarded to the Owner and through the Construction Manager.
- B. Obtain, arrange and/or pay for any necessary permits, tests and inspections.
- C. Furnish all test instruments and materials required at the time of final inspection. The inspection outlines in the American Standard Practice for the Inspection of Elevators, Inspector's Manual A17.2 (latest edition) will be followed.
- D. After hour tests of systems such as emergency generators or fire service shall be conducted at no extra cost to the Owner.

1.08 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

A. Delivery, Storage and Handling

- 1. Deliver materials to the site ready for use in the accepted manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name.  
Delivered materials shall be identical to accepted samples.
- 2. Store materials under cover in a dry and clean location, off the ground. Remove delivered materials which are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.

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B. Temporary Elevator

1. For requirements of temporary elevators, refer to Supplemental General Requirements, Section 1500, Paragraphs .06 and .07.

1.09 CONTRACT CLOSE-OUT

A. Guarantee and Warranties

1. Warrant the equipment installed under these specifications against defects in material and workmanship and correct any defects not due to ordinary wear and tear or improper use or car which may develop within one year from the date each elevator is completed and placed in permanent operation and accepted by the Owner and Construction Manager. This section shall apply separately to each unit as completed and placed in operation.
2. This warrantee shall be written and issued at the completion of each unit prior to final payment.

1.10 OPERATING AND MAINTENANCE DATA

- A. Furnish neatly bound instructions giving the method of control and operation, together with data on all switches, relays and other devices as will be needed for serving and for ordering replacements.
- B. Furnish bound instructions and recommendations for maintenance, with special reference to lubrication and lubricants.
- C. Furnish sets of complete and legible "as-built" field wiring diagrams, layouts and straight line diagrams showing the electrical connections, functions, and sequence of operation of all apparatus connected with the system both in machine room and in hoistway, together with photographs or cuts of controller repairs parts with part numbers listed.
- D. Wiring Diagrams shall be accurately and completely transferred to AutoCAD files by the Contractor and submitted as follows:
  - a. Drawing files in AutoCAD Release 12 Format for DOS on 3 1/2" HD discs or other approved high density discs.
  - b. Three (3) sets of blueprints.
  - c. Two (2) sets of 3 mil Mylar reproductions.
- E. All required data including operation and maintenance manuals, catalog information, installation instruction manuals, charts, tables, etc., shall be submitted as follows:



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- a. Document files in ASCII or Microsoft Word for Windows format on 3 1/2" HD discs or other approved high density discs.
- b. Charts, tables, etc. in Microsoft Excel format on 3 1/2" HD discs or other approved high density discs.
- c. Three (3) printed sets.

#### 1.11 MAINTENANCE

- A. Maintenance Alternates 1 and 2: See Warranty Service Agreement for maintenance and extended warranty requirements.

### PART 2 PRODUCTS

#### 2.01 MATERIALS

- A. Rolled Steel Sections, Shapes, Rods: ANSI/ASTM A36
- B. Casing: ASTM A139 Grade A steel
- C. Sheet Steel: ANSI/ASTM A366 Class with matte finish
- D. Stainless Steel: ASTM A167 304 No. 6 finish hairline finish
- E. Aluminum: ASTM B221 extruded

#### 2.02 FINISH MATERIALS

- A. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide
- B. Finish Paint (for Metal Surfaces): Alkyd enamel, semi-gloss custom color as specified by the Architect.

#### 2.03 GENERAL DESCRIPTION

- A. Passenger Elevators - PE 1 to 3
  - 1. Quantity - Three (3)
  - 2. Type - Passenger

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3. Capacity (lbs.) - 4,000
4. Speed (fpm) - 500
5. Travel in feet - 179' - 6"
6. Number of Landings - 14 @ G, 2 to 14
7. Number of Openings - Same as Landings
8. Front - All
9. Rear - None
10. Operation - Three (3) car group automatic
11. Control - Variable voltage using solid state motor drives
12. Number of push button risers - One (1)
13. Platform size - 8'-0" wide x 6'-2" deep
14. Guide rails - Steel tees at sides - provide rail backing as required
15. Buffers - Oil
16. Cab allowance included - See Section 14205
17. Car door size - 4'-0" wide x 7'-0" high
18. Hoistway door size - Same as car
19. Door operation - Single speed center opening
20. Fixture and signals - As further specified
21. Machine type - Gearless traction
22. Machine Location - Overhead
23. Power Supply -460-3-60

**B. Theater Elevators - HPE 4**

1. Quantity - One (1)

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2. Type - Passenger
  3. Capacity (lbs.) -6,000
  4. Speed (fpm) - 150
  5. Travel in feet - 43' -6"
  6. Number of Landings - 3 @ G, B2 and B3
  7. Number of Openings - Same as landings
  8. Front - All
  9. Rear - None
  10. Operation - Simplex selective collective
  11. Control - AC for hydraulic
  12. Number of push button risers - One (1)
  13. Platform size - 7'-0" wide x 9'-0" deep
  14. Guide rails - Steel tees at sides - provide rail backing as required
  15. Buffers - Spring
  16. Cab allowance included - See Section 14205
  17. Car door size - 4'-6" wide x 7'-0" high
  18. Hoistway door size - Same as car
  19. Door operation - Two speed center opening
  20. Fixture and signals - As further specified
  21. Machine type - Hydraulic pump
  22. Pump Location - At B2 level
  23. Power Supply -460-3-60
- C. Passenger Elevator - PE 5 - Not Used

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D. Passenger Elevators - PE 6 to 11

1. Quantity - Six (6)
2. Type - Passenger
3. Capacity (lbs.) - 8,000
4. Speed (fpm) - 500
5. Travel in feet - 125'-0"
6. Number of Landings - 4 @ 2, 5, 8 and 11
7. Number of Openings - 8
8. Front - 4 @ 2, 5, 8 and 11 - (West Side - Loading)
9. Rear - 4 @ 2, 5, 8 and 11 (East Side - Unloading)
10. Operation - Six (6) car group automatic
11. Control - Variable voltage using solid state motor drives
12. Number of push button risers - Two (2) at West side (loading)
13. Platform size - 6'-10" wide x 12'-3" deep
14. Guide rails - Steel tees at sides - provide rail backing as required
15. Buffers - Oil
16. Cab allowance included - See Section 14205
17. Car door size - 5'-0" wide x 7'-0" high
18. Hoistway door size - Same as car
19. Door operation - Two speed center opening
20. Fixture and signals - As further specified
21. Machine type - Gearless traction
22. Machine Location - Overhead

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23. Power Supply -460-3-60

E. Service Elevator - SE 12

1. Quantity - One (1)
2. Type - Passenger/Service
3. Capacity (lbs.) - 6,000
4. Speed (fpm) - 350
5. Travel in feet - 222'-6"
6. Number of Landings - 17 @ B3, B2, B1, G, 2 thru 14
7. Number of Openings - Same as landings
8. Front - All
9. Rear - None
10. Operation - Simplex selective collective
11. Control - Variable voltage using solid state motor drives
12. Number of push button risers - One (1)
13. Platform size - 6'-3" wide x 10'-2" deep
14. Guide rails - Steel tees at sides - provide rail backing as required
15. Buffers - Oil
16. Cab allowance included - As further specified
17. Car door size - 4'-6" wide x 7'-0" high
18. Hoistway door size - Same as car
19. Door operation - Two speed side opening
20. Fixture and signals - As further specified
21. Machine type - Geared traction

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- 22. Machine Location - Overhead
- 23. Power Supply -460-3-60
- F. Kitchen Elevator - KE 13
  - 1. Quantity - One (1)
  - 2. Type - Passenger/Service
  - 3. Capacity (lbs.) - 4,000
  - 4. Speed (fpm) - 350
  - 5. Travel in feet - 179'-6"
  - 6. Number of Landings - 14 @ G, 2 to 14
  - 7. Number of Openings - Same as landings
  - 8. Front - All
  - 9. Rear - None
  - 10. Operation - Simplex selective collective
  - 11. Control - Variable voltage using solid state motor drives
  - 12. Number of push button risers - One (1)
  - 13. Platform size - 6'-0" wide x 8'-4" deep
  - 14. Guide rails - Steel tees at sides - provide rail backing as required
  - 15. Buffers - Oil
  - 16. Cab allowance included - As further specified
  - 17. Car door size - 4'-0" wide x 7'-0" high
  - 18. Hoistway door size - Same as car
  - 19. Door operation - Two speed side opening
  - 20. Fixture and signals - As further specified

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21. Machine type - Geared traction
  22. Machine Location - Overhead
  23. Power Supply -460-3-60
- G. Gymnasium Elevator - HPE 14
1. Quantity - One (1)
  2. Type - Passenger
  3. Capacity (lbs.) - 4,000
  4. Speed (fpm) - 125
  5. Travel in feet - 43'-6"
  6. Number of Landings - 4 @ B3, B2, B1 and G
  7. Number of Openings - Same as landing
  8. Front - All
  9. Rear - None
  10. Operation - Simplex selective collective
  11. Control - AC for hydraulic
  12. Number of push button risers - One (1)
  13. Platform size - 7'-0" wide x 6'-9" deep
  14. Guide rails - Steel tees at sides - provide rail backing as required
  15. Buffers - Spring
  16. Cab allowance included - See Section 14205
  17. Car door size - 3'-6" wide x 7'-0" high
  18. Hoistway door size - Same as car
  19. Door operation - Single speed center opening



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20. Fixture and signals - As further specified
21. Machine type - Pump unit
22. Pump Location - At B3 level
23. Power Supply - 460-3-60

#### 2.04 FIXED HOISTWAY EQUIPMENT

##### A. Guide Rails, Inserts and Brackets

1. Provide machine standard T section guide rails with tongue and grooved joints for the car and counterweight. Use not less than 22.5 pound car rails for PE 6 to 11 and SE 12, and 15.0 pound rails for all other elevators.
2. The section modules and moment of inertia of the fishplates shall be not less than that of rail. Connect rails to fishplate with for (4) bolts.
3. For concrete and concrete block hoistways furnish rail brackets and provide inserts and an insert location drawing to Masonry Contractor. Installation of inserts shall be provided under Section 04223, Interior Concrete Block.
4. Brackets shall be used to support the rails from the hoistway framing and/or inserts. The rails shall be attached to the brackets by heavy clamps or clips. Bolting or welding rails to brackets shall only be allowed in certain instances.
5. For the hydraulic elevators, provide rail backing where the vertical distance between support framing is greater than 14'-0" and less than 16'-0", and no intermediate support framing is shown on the drawing.

##### B. Buffers

1. Provide buffers with necessary blocking and horizontal steel braces under the car and counterweight.
2. The buffers shall have been tested by a qualified testing laboratory and approved as complying with the ASME Code. The buffers marking plate shall indicate the manufacturer's name, identification number and stroke.
3. Provide spring type buffers for HPE 4 and HPE 14.
4. Oil buffers shall bring the car and counterweight to rest from governor tripping speed at an average rate of retardation not exceeding gravity.

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- a. Oil buffers shall be of the spring return type and shall have means of checking oil supply level.
5. Use reduced stroke buffers with associated terminal slowdown devices where runbys are restrictive.

C. Normal and Final Terminal Stopping Devices

1. Provide normal terminal stopping devices to stop the car automatically from any speed obtained under normal operation within the top and bottom overtravels independent of the operating devices, final terminal stopping device and the buffers.
2. Provide final terminal stopping devices to stop the car and counterweight automatically from the speed specified within the top clearance and bottom overtravel.
3. Hydraulic elevators shall have emergency terminal speed limiting devices to ensure that the plunger does not strike its stop ring at more than 100 fpm.
4. The terminal stopping devices shall have rollers with rubber or other approved composition tread to provide silent operation when actuated by the fixed cam in the hoistway.

D. Interlocks, Contacts and Unlocking Devices

1. Equip each elevator hoistway door with a positive interlock which shall prevent the operation of the elevator unless all elevator doors are closed and maintained closed when elevator is away from the landing. The interlocks shall also prevent the opening of a hoistway door from the landing side unless the car is within the landing zone and is either stopped or being stopped at that level. Retiring cams used to actuate interlock shall be securely fastened to car construction and shall be designed to operate without objectionable noise, shock or jar. Design interlocks so that they are not easily accessible from the landing side.
2. Provide electric contacts on top emergency exits to prevent the operation of the elevator when exits are open.

E. Hoistway/Car Door Hangers, Sheaves and Tracks

1. Provide a sheave type two-point suspension hanger and track for each hoistway and car door. Sheaves shall be hardened steel, polyurethane tired, not less than 3 1/4 inches in diameter with sealed grease packed precision ball bearing.

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2. The upthrust shall be taken by a roller mounted on the hanger and arranged to ride on the underside of the track.
3. The track shall be of formed cold rolled steel or cold drawn steel and shall be rounded on the track surface to receive the hanger sheaves. The track shall be removable and shall not be integral with the header.

F. Stop Switches

1. Provide a readily accessible switch for stopping and maintaining the elevator out of service in pit, on top of car, in overhead sheave rooms and, if required by Code, in car operating panel.

G. Hoistway Entrance Structure

1. Frames - The frames shall be constructed of 14 gauge stainless steel with No. 4 finish.
  - a. Passenger Elevators: Unit frame mitered with welded and ground smooth corners. Provide 2" wide square profile.
  - b. SE 12 and KE 13: Manufacturer's standard bolted construction with 2" square profile. At both ends of header piece provide stainless steel, welded, ground smooth end caps.
2. Doors - The doors shall be constructed of 16 gauge stainless steel with No. 4 finish, not less than 1-1/4" thick, reinforced to accept hangers, interlocks or door closers. Equip all hoistway landing doors for with one-piece full height non-vision wings of material and finish to match hall side of door panels.
3. Entrances shall bear 1 1/2 hour label of Underwriters Laboratories, Inc.
4. Provide each door panel with two removable laminated plastic composition guides, arranged to run in sill grooves with a minimum clearance. The guide mounting shall permit their replacement without removing the door from the hangers. A steel fire stop shall be encased in each guide.
5. Provide the meeting edge of center opening doors with continuous black rubber astragal bumper strips. These strips shall be relatively inconspicuous when the doors are closed and shall be easily replaceable. Also, provide rubber bumpers at the top and bottom of each section of door to stop them at their limit of travel in opening direction.

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6. Sills - Provide extruded nickel silver sills with the nosing approximately one (1) inch deep and running the full length of door travel. The sills shall be at least 3/8 inch thick. The wearing surface shall be of a non-slip type with the door guide grooves providing a minimum clearance for the guides. Rigidly secure the sills to the building construction by means of steel sill support brackets or blocking with necessary metal shimming or adjustments.
7. Provide a special key so that an authorized person can open any landing door when the car is elsewhere. The key hole shall be fitted with a stainless steel ferrule.
8. Struts - Struts shall be hot rolled steel angles not lighter than 3 inches by 3 inches by 1/4 inch. Extend the struts from top of sill to either the bottom of floor beam or intermediate framing above. Bolt struts in place with not less than two (2) bolts at each end. Strut clip angles or brackets shall have a thickness not less than the thickness of the supported strut.
9. Track Support - 3/16 inch thick steel track support plate shall extend between and be bolted to the vertical steel struts with no less than two (2) bolts at each end.
10. Track Covers - 14 gauge steel coverplates shall extend the full travel of the doors. Covers shall be made in sections for service access to hangers, sheaves, tracks and interlocks. The sections above the door opening shall be movable from within the elevator car. Cover fastening devices shall be non-removable from the cover.
11. Fascias - 14 gauge painted steel fascia plates shall extend at least the full width of the door and be secured at hanger support and sill with oval head machine screws. Reinforce fascia to allow not more than 1/2 inch of deflection.
12. Provide fascia plates where the clearance between the edge of the loading side of the platform and the inside face of the hoistway enclosure exceeds the code allowed clearance.
13. Toe Guards - Provide 14 gauge painted steel toe guards to extend 12 inches below any sill not protected by fascia. The toe guards shall extend the full width of the door and shall return to the hoistway wall at a 15 degree angle and be firmly fastened.
14. Dust Covers - Provide 14 gauge painted covers to extend 6 inches above any header not protected by fascia. The dust covers shall extend to a full width of travel of the doors, return to the hoistway wall at a 15 degree angle and be firmly fastened.